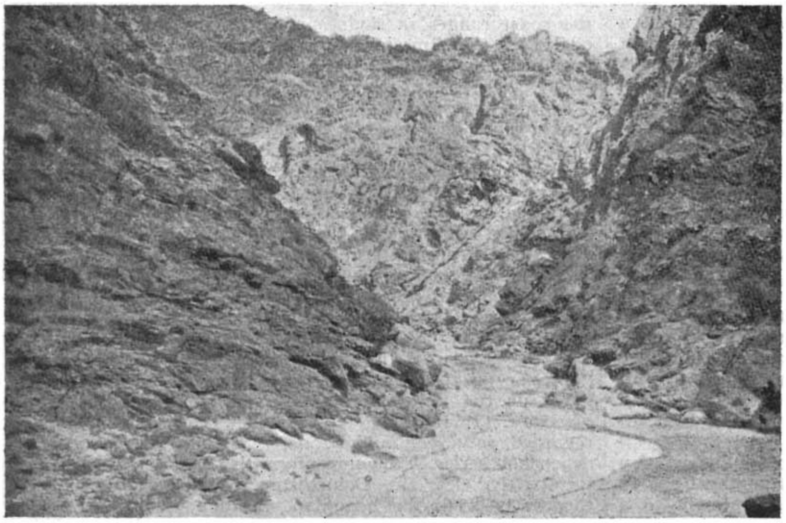
been derived from folia of quartz in the old mica-schists, a view quoted (p. 33) with hesitation from Mr. A. McKay, reminds us of the problems of the Klondike. The uptilted lacustrine gravels, on which the Pleistocene moraines rest unconformably, are regarded provisionally as Pliocene, but raise an interesting stratigraphical question. The photographic illustrations, one of which we reproduce, are admirable, and may be commended to the notice of the authorities who hold the public purse at Cape Town. The petrographic section, where the rocks are described from the point of view of the laboratory, includes analyses of several of the schists, and photographs of rock-slices on the unnecessarily liberal scale adopted in the first bulletin of this survey.

The *Summary Report of the Geological Survey Department of Canada* for 1906, which bears two dates on its title-page, 1906 and 1907, informs us that the survey has decided to send its maps and reports "free to any *bona fide* applicant in Canada." This surpasses even the generosity of the United States Survey, which still, we believe, places a price upon its maps. The colour-printed sheets of part of Nova Scotia, surveyed by Mr. Hugh Fletcher, and sent us with the report, are as large as those for which we charge eighteenpence in England. Of course the topography shows far less detail, but the scale is, like ours, one inch to one mile, and the sheets have the price of 10 cents printed on them. We gather, however, on the other hand, that the sums paid in Canada to the junior members of the staff are not at all adequate, considering the competition with mining companies, which draw away the best geologists. The same difficulty has been met in India (Circular of the Department of Commerce and Industry, September 7, 1906) by a courageous increase in the salaries of the official geologists. The Canadian Survey spreads its operations over an enormous field, the areas examined being largely determined by the economic requirements of the year. The routes of projected railways naturally receive attention. This is Mr. A. P. Low's first annual report.



The Manuherikia River, New Zealand, forming a gorge along fault-rifts in the schist series.

We fancy that Mr. G. R. Mansfield's paper on the Roxbury conglomerate near Boston (*Bull. Mus. Comp. Zoology at Harvard*, vol. xlix., 1906, pp. 91–272) would not have been a third as long had it not been presented as a thesis for a degree. Pages 105–151 contain a disquisition on conglomerates in general, according to the custom of American geologists when introducing a special subject in a literary form. The conclusions on p. 259 make us wonder whether the Roxbury conglomerate was worth describing at all; but this is probably because our sense of irritation, in this busy world, inclines to make us unfair to an obviously accurate observer.

G. A. J. C.

THE FEDERAL CONFERENCE ON EDUCATION.

It is often made evident that the Government in this country leaves very important matters to be initiated and even carried on by private enterprise. Those who do not already know, will hardly be surprised to learn that the Federal Conference on Education, which was opened by Lord Crewe on May 24 in Caxton Hall, was organised by an independent society, the League of the Empire, and the League may well be proud, for it is understood that the next conference, which will be held in 1911, will be convened by the Government.

The business of the conference was divided as follows:—There were first of all the meetings of the representatives of colonial and Indian education departments and their committees. These took place behind closed doors, and were attended by the officials of the English, Welsh, Scotch, and Irish Boards. This official conference discussed a number of important matters, and we give some of the results of their deliberations. For instance, they decided that at present, owing to the way in which certificates are awarded and various local conditions, it is impossible to arrive at any complete recognition of the teachers' certificates issued by different educational bodies in different parts of the Empire. The desirability was recognised of teachers and inspectors acquiring experience in other parts of His Majesty's dominions than their own, and the conference thought that financial and administrative arrangements should be made to enable this to take place.

While it was not deemed desirable to attempt uniformity as to curricula and text-books, it was urged that the different education departments should define year by year with precision the terms used in their publications. Other important conclusions expressed were that a conference of representatives chosen by the Governments should be held every four years, and that the Imperial Government should summon the first. Furthermore, the present conference was unanimously agreed as to the importance of a central bureau of educational information.

The next series of meetings to be considered are those of the full conference, consisting of the representatives already mentioned and delegates from universities and associations. On Monday, May 27, Lord Reay presided, and higher technological education was considered, and various speakers, including Prof. Hopkinson (of Cambridge), Dr. Headlam (Principal of King's College, London), Dr. Bodington (Vice-Chancellor of the University of Leeds), and Dr. G. R. Parkin (University of New Brunswick), urged that technical training should go on side by side with the study of classics, poetry, and philosophy. Afterwards the following resolution, proposed by Dr. Clay, was unanimously agreed to:—

"That it is desirable that the Colonial Office and the Board of Education should cooperate in issuing officially, particulars as to the courses of study, fees, expenses of living, &c., at colonial universities, technical colleges and agricultural colleges, together with statements of the advantages attaching to their degrees and diplomas, and that information should be circulated in the colonies as to similar advantages and facilities which exist in this country."

On the following day, Mr. Inch (Superintendent of Education, New Brunswick) took the chair, and Mr. C. W. Bailey (Liverpool University) supported the idea that freedom should be given to each individual school, while Dr. H. J. Spencer (Headmasters' Association) pointed out with regard to the suggestion that each school should shape its own curriculum according to the needs of its pupils that there were several types of a good general education, any one of which might be chosen.

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On Wednesday, May 29, under the presidency of the Vice-Chancellor of Cambridge University, two topics were discussed; first, the advisability of various educational bodies recognising each other's certificates of admission was generally agreed upon, and afterwards the question of cooperation between the old boys' associations throughout the Empire was discussed. Dr. Gow (Headmaster of Westminster) spoke of the difficulties of organising permanent associations of old boys of English public schools who go to the colonies, while Mr. L. A. Adamson (Victoria Secondary Schools' Association) made the following suggestions:—(1) that it is desirable to form a union of the great boys' schools of the Empire; (2) that this will best be done through their "old boys'" associations; (3) that the League of the Empire be asked to act as the organising centre.

At the open meeting on May 27, Sir Philip Magnus presided, and Sir Horace Plunkett gave an address on agricultural education in which he traced the work that had been going on in Ireland, and said that the problem of rural life was to be solved mainly by education, general and technical. During the discussion, Lord Monteagle pointed out that the farmer should be taught to appreciate technical instruction by practical demonstrations, and that the interests of the children should be awakened by nature-study.

Lord Elgin took the chair at a similar meeting on May 28, when the connection between elementary and secondary schools was discussed. The chairman pointed out that it was now the boast of Scotland that the path was open from the parish school to the university, and he thought that Scotland had done a great deal to bring about what is required. Several representatives from the colonies described in some detail the state of affairs in their own countries.

Meetings were arranged by the three standing sections of the League and other sections which were constituted for the occasion. The following is a list of sections with their chairmen:—History, Prof. Bury; nature-study, Sir John Cockburn, K.C.M.G.; museums, Lieut.-Colonel Plunkett; universities, Sir Arthur Rücker; technical, Sir Philip Magnus, M.P.; teaching of English, Prof. Saintsbury; training of teachers, Canon G. C. Bell.

Such a large number of papers were read in the various sections that it is impossible to summarise or even enumerate them here. In the technical education section many important aspects of the subject were dealt with in a series of special papers, which included the questions of training and research, both in this country and in the colonies.

The museums' section was chiefly occupied in passing the following useful resolutions:—

(1) "That the formation of school collections illustrative of science or art is a valuable aid to education" (proposed by Dr. R. F. Scharff).

(2) "That when school collections are made to illustrate natural history or other branches of knowledge, arrangements for the exchange of such collections between various parts of the Empire will assist the objects for which the League is instituted" (proposed by Dr. Chalmers Mitchell).

(3) "That teachers and others should discourage the making of such collections as might tend to the extermination of rare plants or animals, and should assist in preserving such objects by fostering a knowledge and love of nature" (proposed by Sir Harry Johnston, G.C.M.G.).

(4) "That this conference recognises the value of arrangements for the circulation of museum objects, as organised at the Victoria and Albert Museum, South Kensington, and at the Dublin Museum of Science and Art, at Sheffield Museum, and elsewhere, and warmly advocates an extension and development of the system" (proposed by Prof. Kidd).

(5) "That this conference recommends the organisation of a permanent collection of objects specially interesting and useful to those engaged in educational work, in connection with one of the great museums in London. That such a collection should include typical school museums and the outlines of a local educational museum" (proposed by Mr. John Maclaughlan).

In the nature-study section the following resolutions were carried:—

(1) "As nature-study gives that wide knowledge of the world and its products which is required throughout life, it should be inculcated at all stages of sound general education, and this section recommends its earnest encouragement in the home, in the school, and in the outside world. Furthermore, this section trusts that the education authorities of the Empire will endeavour to extend and encourage knowledge self-gained from original observations, as a vitalising factor in the progress to full intellectual efficiency" (proposed by Mr. T. R. Ablett).

(2) "That the supply of teachers acquainted with true methods of nature-study being the greatest present requirement, special efforts be made to provide facilities for the proper preparation for the work, of students and teachers in training" (proposed by Miss Rees George).

The museum section arranged exhibits consisting of a large series of travelling cases from Dublin Museum, and one of the cases illustrating the structure of birds now being arranged in the Lawson Memorial Wing of Eton College Museum.

In connection with the nature-study section were a number of exhibits illustrating the main phases of nature-study in this country, including the work of the Royal Drawing Society. The hon. secretary of the section on May 27 gave a lantern lecture entitled "Illustrations of Nature-study."

A large series of photographs was sent by the Government of New Zealand illustrating its educational work, and a very large number of publishers and makers of apparatus exhibited in the trade section.

Mr. S. H. Butcher, M.P., acted as chairman of the official conference, and Mrs. Ord Marshall as honorary secretary.

THE BIOLOGY OF THE COLORADO BEETLE AND ITS ALLIES.[1]

DR. TOWER, who is already well known as the author of a careful monograph on the development of colour in insects, has set forth in this bulky volume the results of his prolonged researches into the life-histories and interrelations of a group of plant-feeding beetles, one species of which is celebrated as a dreaded potato pest. The work certainly bears ample witness to the patience and ingenuity of this observer, who is one of that ever-increasing school of zoologists holding the view that further light can be thrown on the mysterious problem of evolution mainly by observation of and experiments on the living animal.

The first chapter treats of the geographical distribution of the genus Leptinotarsa; southern Mexico is regarded as the centre of origin of the group, whence it has spread southwards to the Isthmus of Panama and northwards to the United States. Much interesting information and speculation on the dispersal of the Colorado beetle *L. decemlineata* is supplied. Spanish caravans and wandering herds of bison are regarded as the agencies whereby the hooked and spined seed-pods of *Solanum rostratum*, the characteristic food-plant of Leptinotarsa, were transported from Mexico to Texas, Arizona, and the eastern slope of the Rocky Mountains; the insects followed in the track of their food-plant, and became established in these areas. The westward advance of civilisation in the middle of the nineteenth century brought with it the cultivated potato, which proved a most acceptable food to the beetles; all obstacles to the eastward extension of this destructive insect were now removed; in 1872 it had reached the Atlantic sea-board, and in less than fifty years it was generally distributed over the United States and southern Canada.

In chapter ii. the variation of colour patterns and structural characters is examined both qualitatively and quantitatively. The nature of the material not lending itself to minutely accurate measurements, the author has evolved a highly complicated series of formulæ which express succinctly forms of coloration on different parts of the body; these formulæ are "seriated into classes," and the percentage of individuals possessing given colour-formulæ

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[1] "An Investigation of Evolution in Chrysomelid Beetles of the Genus Leptinotarsa." By William Lawrence Tower. Pp. x+320; illustrated. (Washington, D.C.: Carnegie Institution of Washington, 1906.)

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